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them." Thus when he returned to Allegheny as Director, his spectroscopic researches were largely confined to the orange, yellow and green regions of the spectrum, since they would be less strongly affected by the smoky sky for which that vicinity is famous; and yet by attending to such limitations he managed to produce his beautiful photograph of the spectrum of *Saturn.* When he returned to the Lick Observatory he found the spectroscopic work in the able hands of Professor Campbell, and himself therefore undertook the solution of a troublesome question —or rather what had been a troublesome question before he came. The Crossley reflector, the 3-foot reflector with which Dr. Common showed the way in the photography of nebulæ, afterwards acquired by Mr. Crossley of Halifax, had been presented by him to the Lick Observatory. The assistants told off to work with it failed to secure any good results, and blamed the instrument as antiquated and almost worthless. The new Director himself undertook to see what was wrong. He found a good deal capable of improvement and spent five months making one change after another. His account of this work (*Astrophysical Journal*, June 1900) is a model of clearness and completeness. At the end of this time the instrument immediately produced pictures of marvellous beauty in abundance. Keeler set himself to photograph the whole of Herschel's nebulæ, and had done more than half at his death. The plates record incidentally a large number of new nebulæ, and he estimated that the number to be discovered by the Crossley reflector could not be less than 120,000. The important fact that more than half the nebulæ turn out to be spiral in form was established from these plates, and has an important bearing on the theory of the cosmogony.

His death was very sudden. He became weak in health in the summer of 1900, being unable to throw off a cold contracted in June, and left the observatory on the 30th of July, with no anxiety, to secure medical treatment and take a holiday. Increasing difficulty in breathing led him to seek skilled assistance in San Francisco on the 10th of August; the dangerous condition of his heart, which had been weak for some years, was realised on the next day; and on the 12th of August a stroke of apoplexy proved fatal.

He had the Rumford Medal of the American Academy in 1898, and the Henry Draper Medal in 1899. He was an editor of *Astronomy and Astrophysics*, and subsequently of the *Astrophysical Journal*, and a member of many learned Societies. He was, as above recorded, both a Fellow and an Associate of this Society. He married on the 16th of June, 1891, Miss Cora S. Matthews, at Oakley Plantation, Louisiana, and leaves two children.

H. H. T.

By the death of Dr. Robert Luther the Society loses one of its oldest Associates, and one who occupied a noteworthy position in the list. There are still three illustrious veterans who were elected

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Associates on the 12th of May 1848 (Faye, Galle, O. Struve), but the next now in sequence form another trio with date the 11th of May 1866 (Auwers, Foerster, Safford). The first three are all that remain of a group of twenty-one, elected when the Council first undertook the suggestion of names, which had been previously left to individual Fellows; and of twenty-one further elections in the years 1849 to 1865 (none, however, being made in the six years 1856 to 1861) Robert Luther was the sole survivor, the date of his election being the 9th of June 1854. He was a marvellous discoverer of minor planets in the days when photography had not made the discovery easy. His first discovery was No. 17, made in 1852; and though Graham, of Cambridge (who discovered No. 9 in 1848), outlives him, the fact that Luther also discovered *Glauke*, No. 288, in 1890 makes his record quite unique.

Carl Theodor Robert Luther was born at Schweidnitz on the 16th of April, 1822. His father, F. H. A. August Luther, had distinguished himself in the war of 1813–15, gaining officer's rank and the Iron Cross, but had lost his right arm in the attack on St. Amand in June 1815. He learnt to write with his left hand, and obtained a civil appointment, marrying in 1818; but his health had been shattered by his wound, and he was pensioned in 1823. From that time to his death in 1844 his life was one long illness, in which he was devotedly nursed by his wife, who died in 1853. Their only son, Robert, born in 1822, went to the Gymnasium at Schweidnitz, 1831 to 1841; thence to the University of Breslau, and (in 1843) to that of Berlin. Here he remained after his father's death in 1844, studying under Encke, Dove, and others, taking a share in computations for the *Astronomisches Jahrbuch* for 1849, &c., doing some laborious work under Encke on cometary orbits, and taking a part in the Berlin observations from 1847 onwards. When Brünnow left the Bilk-Düsseldorf Observatory for Berlin in 1851, Luther was appointed, on the strength of many recommendations, his successor at Düsseldorf. Here, for twenty-six years, his only instrument was a 6-foot refractor, with ring-micrometer; and, on the advice of Argelander and Hülsmann, he used this instrument for planetary observations, and thus was in regular communication with the Bonn, Berlin, Hamburg, Vienna, and other Observatories. He discovered his first small planet on the 17th of April 1852, which was named *Thetis* by Argelander, and the discovery so delighted the people of Düsseldorf that they honoured the event with a public banquet in the *Tonhalle*, or Concert Hall, at which Argelander assisted. Luther was, moreover, so much encouraged by this success, and the recognition of it, that he refused to leave Düsseldorf for better appointments elsewhere, and the little Observatory has to thank him for crediting it with twenty-four planetary discoveries in all, besides three in which he failed to secure priority. In the years 1852 to 1861 he was seven times awarded the Lalande prize for different discoveries. His small salary was increased by the town after his fourth discovery, and again in 1860; in 1861 the State also supplemented it. He was twice decorated by the King, in 1855 and 1863; and many other honours were conferred upon him by learned societies. He was elected an Associate of this Society in 1854.

In the years 1854 to 1857 he prepared the Berlin star-chart for 0^h, containing 4302 stars; and he was no less diligent in computation than in observation. It was due to his computations that Goldschmidt rediscovered the planet *Melete*, which had been thought to be *Daphne*; and in the *Berliner Jahrbuch* for 1865 it is recorded how Luther had rediscovered and reobserved the planets *Calypso* and *Daphne*, which had not been observed for four and six years respectively. Among his numerous calculations may be specially mentioned those of the orbits of *Hebe* (1847–1900), *Parthenope* (1850–1901), *Melete* (1857–1901), *Danaë* (1861–1900), *Glauke* (1890–1901). He worked with the greatest assiduity all his life, and it was specially appropriate that he was elected Associate of the K. Leopoldino-Karolin. Deutsche Akad. der Naturforscher in Halle," whose motto is *Nunquam otiosus*, for Luther only took four holidays from 1852 till his death.

He married in 1859 Fräulein Caroline Märcker, who was born at Essen in 1823 and still survives. Their only son, Alexander Wilhelm Luther, born in 1860, became an Assistant in the Düsseldorf Observatory in 1892, and succeeded his father as Director in 1900.

Robert Luther died on the 15th day of February 1900, after an illness of only three days. H. H. T.